

of the two forms (*proxima* and *palustris*) should be examined as these may show differences not indicated in the shells.

The new variety will probably be found widely distributed in the mountain region of Wyoming, Utah, Montana and Colorado. Apparently the same form has been submitted for identification by Dr. J. C. Needham, of Cornell University, who collected the specimens near Wellsville, Utah.

NEW VARIETIES OF *HELISOMA ANTROSA* FROM WISCONSIN AND MINNESOTA¹

BY FRANK C. BAKER

HELISOMA ANTROSA CAHNI var. nov.

Differing from *antrosa portagensis* F. C. Baker in being very much larger, the aperture relatively wider, not ear-shaped, the upper part not being as acutely elevated above the upper angle of the whorl, the dorsal and ventral carinae of the whorls not acutely cord-like, and the height averaging greater (8-10 per cent.) than in *portagensis*. The shell is thinner than in the latter variety. Spiral sculpture marked.

H. 12.5; D. 18.0; Ap. H. 12.0; D. 7.0 mm. Type.

H. 12.0; D. 18.5; Ap. H. 11.5; D. 6.5 mm. Paratype.

H. 11.0; D. 15.0; Ap. H. 10.5; D. 6.0 mm. Paratype.

TYPE LOCALITY: Big Muskallonge Lake, Vilas Co., Wis.
 TYPES: Univ. Ill., No. Z21124; Paratypes, Acad. Nat. Sci. Phila., No. 141567.

This variety was at first thought to be a variation of *portagensis*, described from Portage Lake, Maine (NAUT. XXII, p. 45; XXIII, p. 8, pl. I, fig. 9), but its normally larger size, differently shaped aperture, and greater relative height seem to mark it as another variety of this wide-spread species. Occasional immature specimens have the upper part of the whorl acutely raised above the dorsal angle of the whorl, but no fully

¹Contribution from Museum of Natural History, University of Illinois, No. 36.

adult specimen has been seen of this form. It is named in honor of Dr. Alvin R. Cahn, of the Department of Zoology, Univ. of Illinois, who collected the material. It is interesting to note that *Stagnicola emarginata wisconsinensis* F. C. Baker was also found in this lake.

HELISOMA ANTROSA SHELLENSIS F. C. Baker, nov. var.

Shell differing from *antrosa* in being higher axially, with a deeper and more conical basal depression and a deeper and more flatly concave spire region; the body whorl bordering these areas is more sharply angled; aperture longer in comparison with width, with a bluntly formed v-shaped angle above and below; sculpture of distinct spiral lines; color always deep brownish; body whorl rounded, not flattened.

L. 9.0; D. 13.0; Ap. L. 8.0; D. 4.5 mm. Type.

L. 9.0; D. 12.0; Ap. L. 8.3; D. 5.0 mm. Paratype.

L. 8.0; D. 12.-; Ap. L. 7.5; D. 4.0 mm. Paratype.

TYPE LOCALITY: Shell Lake, Washburn Co., Wis. TYPES: Univ. Wis. Mus., No. 4627; Paratypes, Univ. Ill., No. Z19354; Phila. Acad. Nat. Sci., No. 141566.

This small form of *antrosa* cannot be placed in any of the described varieties; it resembles *portagensis* in the ear-shaped aperture, but the whorls are rounded, not flat-sided, and the dorsal carina is near the center of the whorl while in *portagensis* it is near the outer edge of the whorl; the same characteristics separate from *cahni*, besides its much smaller size. It somewhat resembles an unnamed lake form which is abundant in the waters of Wisconsin and Michigan, differing in its greater height and centrally-placed dorsal carina. *Shellensis* occurs in a rather deep lake (said to be 40 feet deep) in the St. Croix drainage. Many of these lakes are of artificial origin, but it could not be ascertained whether this was one of these or not. The variety was fairly abundant, and was personally collected.

HELISOMA ANTROSA MINNESOTENSIS nov. var.

Shell differing from all other varieties of *antrosa* in having a perfectly flat or even *convex* spire, the nuclear and second whorls

slightly sunken below the general level of the spire; dorsal carina rather sharply defined, placed near the outer edge of the body whorl, which is flatly rounded; umbilicus small, narrow, deep, the base of the whorl distinctly angulated; aperture about as wide as high, spiral sculpture fine but distinct.

L. 7.0; D. 11.2; Ap. L. 5.5; D. 5.0 mm. Type.

L. 6.0; D. 10.0; Ap. L. 5.5; D. 5.0 mm. Paratype.

L. 5.7; D. 8.5; Ap. L. 5.0; D. 3.8 mm. Paratype.

TYPE LOCALITY: Frontenac, Minn. TYPES: Coll. F. C. Baker.

Three shells, the diagnosis of which is given above, have been in the writer's possession for twenty-five years. Their description has been delayed in the hope that additional material might be found. None has been offered, and it seems desirable to publish the form that others may be on the watch for it. The chief characteristic is the very flat spire, so unusual in *antrosa*, and the very small, narrow umbilicus. The specimens were given to the writer many years ago by Sister Kostka, a Catholic nun of Frontenac, who made quite a collection of Minnesota mollusks.

Helisoma antrosa is a notable example of acceleration in evolution, due to a lake environment. The typical form is a river or creek species and varies very little in the south—Alabama, Oklahoma, Arkansas, etc. Even in Illinois the form is uniform and very abundant in the streams in the southern part of state. In the glacial lakes of the northern part of the United States, especially in Michigan, Wisconsin and Minnesota, each lake, or series of lakes, appear to have its own particular form. Some of these lakes are without present outlet, Big Muskal-longe Lake being of this character. What the many lakes in southern Canada and in the unexplored waters of Minnesota contain can only be surmised.

Figures of the varieties, as well as of the radula of *cahni*, will be published in the writer's Monograph of the Fresh Water Mollusca of Wisconsin.